VOCATIONAL STRUCTURE AND CONFIRMATORY BIAS: USING DIFFERENTIATION AND INTEGRATION TO PREDICT BIAS IN AN OCCUPATIONAL INFORMATION SEARCH

By

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This study was designed to investigate the relationship between vocational differentiation and integration and the tendency to engage in confirmatory bias when gathering information about occupations. Subjects were pretested using vocational structure grids and were then assessed on three indicators of bias in a reading and thought listing task, resulting in a 2 (high and low differentiation) x 2 (high and low integration) x 2 (high and low occupational favorability) between subjects design. Contrary to predictions, individuals high in integration were found to exhibit greater bias than those low in integration. Differentiation was not found to be predictive of bias. All subjects, regardless of vocational structure, exhibited confirmatory bias on the thought listing measure. Results were interpreted as supporting

the value of integration in predicting bias and as highlighting the need for further research directed at determining the adaptiveness or maladaptiveness of confirmatory bias for particular individuals and situations.

CHAPTER 1
INTRODUCTION

For the last two decades researchers in personal construct theory (Kelly, 1955) have investigated vocational construct systems, delineating important structural features of these systems and identifying factors that determine their effectiveness in construing the world of work. Two of the important structural features that have emerged from this work are differentiation, defined as the number of independent construct dimensions contained in a system, and integration, the degree of organization among the constructs in the system. There are theoretical reasons to hypothesize that larger, more organized systems may be more useful in making vocational decisions. This chapter overviews that rationale and the accompanying literature that will be reviewed more thoroughly in Chapter 2.

According to Kelly (1955), an individual's thoughts and actions are a function of the way in which he or she construes and anticipates events. People are viewed as active interpreters of reality, seeking patterns and relationships among events in order to more effectively predict the outcomes of possible courses of action. This

view of individuals as personal scientists and architects of their own construing systems underlies Kelly's emphasis on the dichotomous, systemic nature of personal constructs.

In order to discern meaningful patterns in an otherwise unbroken flow of information, individuals must be able to differentiate aspects of reality from one another. Thus, Kelly (1955) posited that contrast is the basis of a person's ability to form meaning. For example, the idea of "dark" only makes sense in relation to the idea of "light," "hot" in relation to "cold," and so on. Kelly (1955) argued that, on the basis of their experiences with the world, people form dichotomous units of meaning (e.g., hot vs. cold) useful for both discriminating between and perceiving similarities among environmental stimuli. These bipolar dimensions, called constructs, are organized into hierarchical systems that allow individuals to understand and interpret relationships between events and, thus, to better "chart a course of behavior" (Kelly, 1955, p. 740). Taken collectively, Kelly (1955) noted that these dimensions form what he called the "vocational construct system." Neimeyer (1988) described this system as "an interrelated matrix of bipolar dimensions whose focus of convenience is occupational or vocational experience (e.g., high vs. low salary)" (p. 441).

In addition to characterizing constructs as dichotomous and systemic, Kelly (1955) emphasized their

idiographic nature. Formed as they are by the unique interaction of each individual with the world, construct systems vary from person to person in many ways. Together with his Individuality Corollary (Kelly, 1955), Kelly's (1955) assertion that a construct system is "composed of a finite number of dichotomous constructs" (p. 59) suggests that people differ in the absolute number of dimensions contained in their systems. The same reasoning can be applied to Kelly's (1955) emphasis on the importance of hierarchical structure: One can surmise that the degree of organization between constructs in a system will vary among individuals. The first of these two dimensions of individual variation is referred to as differentiation, "the relative number of different dimensions of judgment used by a person" (Tripodi & Bieri, 1964, p. 22). The second is termed integration, "the extent to which the dimensions are organized into an interrelated system of perceptions" (Neimeyer, 1988, p. 452).

Differentiation and integration may be hypothesized to have important implications for the usefulness of the construct system to the person. For example, a person who uses only two constructs, high vs. low salary and high vs. low status, to evaluate occupations may make less effective choices than a person who uses those two constructs in addition to a third, good vs. poor possibility for

advancement. Thus, higher levels of differentiation may confer some advantages for career decision making.

It was precisely this reasoning that led Oppenheimer (1966) and Bodden (1970) to predict that cognitive complexity, operationalized as the degree of differentiation, would be positively related to effective vocational decision making. In his initial work, for example, Bodden (1970) argued that if "cognitively complex persons are able to make finer discriminations among stimulus information input . . . then [they] should be more likely to make appropriate vocational decisions" (p. 364). Results of this early work did seem to show a positive relationship between differentiation and appropriate choice of a career and inspired a program of research that has endured for 2 decades. Meanwhile, a parallel literature was developing on the other facet of cognitive complexity, integration.

Kelly's (1955) theory would predict that vocational construct systems that are more organized, that is, systems in which the construct dimensions are closely interrelated, will be more useful in making decisions about careers. For example, two people might have systems made up of the same three constructs (high vs. low salary, high vs. low status, good vs. poor possibility for advancement); these systems, while equivalent in differentiation, might differ in integration. The individual for whom these dimensions were

significantly intercorrelated (i.e., integrated) could make predictions about salary and status on the basis of advancement possibilities. This person would make decisions more easily and efficiently than the other person, who possessed the same system but for whom the constructs were not meaningfully related. A highly integrated system, then, would seem to be helpful to the individual in adapting his or her behavior to perceived relationships in the world.

Cochran (1977, 1983) based his work on this line of reasoning. Specifically, he predicted that "a more interrelated set of constructs would allow a decider to more easily integrate considerations into an overall evaluation of alternatives, since strong and definite relations decrease ambiguity of constructs" (Cochran, 1977, p. 241). The research he conducted on integration has demonstrated relationships between this vocational structure variable and relevant aspects of career information processing, for example, decision making reaction times (Cochran, 1977).

Thus, for theoretical and empirical reasons, researchers concluded that high levels of differentiation and integration are desirable. As a consequence, many studies have been conducted over the past 20 years in an attempt to identify ways to increase levels of differentiation. This literature has coexisted with

research published on integration, but the two lines of inquiry remained separate until recently.

In the last few years, some research findings have begun to call into question the practical utility of the differentiation concept, previously thought to have been demonstrated by Bodden (1970) and Bodden and Klein (1972). In a replication of the Bodden (1970) design, for example, Leso and Neimeyer (1991) did not find any relation between differentiation and appropriateness of career choice. Likewise, other investigators (e.g., Cesari, Winer, & Piper, 1984; Winer, Cesari, Haase, & Bodden, 1979) have failed to find significant relationships between differentiation and career decidedness or career maturity.

The results of these studies caused Cesari et al. (1984) to call for a demonstration of the practical relevance of the differentiation concept. Neimeyer, Nevill, Probert, and Fukuyama (1985) responded to this concern by creating and testing a model of vocational construct system development that included both differentiation and integration. In this and a subsequent study (Nevill, Neimeyer, Probert, & Fukuyama, 1986) these researchers related both structural variables to other established measures of vocational development and demonstrated that the factors interact in important ways to predict accuracy of information recall and levels of career self-efficacy. Importantly, these investigators used

cognitive structure variables to predict behavioral and attitudinal outcomes that were immediate, rather than distant, effects. That is, they did not try to predict a global, distal outcome like choice of an appropriate career, as Bodden (1970) did but, instead, aimed their efforts at delineating relationships of a more proximate nature, for example, between structural variables and accuracy of information recall (Nevill et al., 1986).

In summary, the apparent importance of differentiation and integration when viewed from a theoretical standpoint has led many researchers in the area of vocational behavior to focus their efforts on investigating these variables and their correlates. While the importance of the integration concept appears to have been demonstrated (Cochran, 1977, 1983; Nevill et al., 1986), results of studies attempting to link levels of differentiation to vocationally relevant behavior have proved equivocal (see Leso & Neimeyer, 1991). The most fruitful efforts to investigate the practical relevance of these variables seem to have come from recent work on the developmental model of vocational structure (Neimeyer et al., 1985), which incorporates both differentiation and integration and focuses on proximal, rather than distal, aspects of career-relevant attitudes and behavior.

The present study extends previous work on the developmental model by demonstrating a relationship between

vocational structure and a proximal aspect of career decision making. This approach is in contrast to Bodden's earlier work, which attempted to use differentiation to predict a long-range, distal outcome, i.e., choice of an appropriate career. The present study attempted to use both differentiation and integration to predict the degree of bias in an individual's occupational information search. Specifically, it was expected that higher levels of both differentiation and integration would be shown to be positively related to an individual's tendency to conduct an unbiased, rather than a biased, information search on occupations.

The term "bias" in this research refers to an individual's tendency to seek out, attend to, and remember information that is confirmatory, rather than disconfirmatory, of her or his preexisting expectations. As defined here, an unbiased person would be one who is equally willing to attend to and consider disconfirmatory, as well as confirmatory, information. It was assumed in this study that bias would be maladaptive in career decision making, because it might cause a person to make decisions without adequate consideration of potentially important information.

CHAPTER 2
REVIEW OF THE LITERATURE

This chapter provides a review of the research literatures relevant to this project. The following two sections review the aspects of the literature on differentiation and integration that have investigated the practical relevance of these variables. A third section describes research on the developmental model of vocational identity development. Studies pertaining to the notion of confirmatory bias will then be discussed. In the final section, the rationale and hypotheses of the present study are presented.

An attempt was made to be inclusive in reviewing the literature on vocational construct systems and the developmental model of vocational structure, as the rationale for and the predictor variables in this study come directly out of this literature. The literature on bias, particularly in social psychology, is too large to be reviewed extensively here. References to some particularly important works on the nature of bias, as well as literature on bias in the area of vocational decision making, are included.

Differentiation

When James Bieri (1955) first developed the concept of cognitive complexity, he viewed complexity as being equivalent to differentiation, "the relative number of different dimensions of judgment used by a person" (Tripodi & Bieri, 1964, p. 22). Because a larger number of judgment dimensions affords the individual more alternative standpoints from which to construe information, more highly differentiated people are regarded as possessing more complex frameworks for the construction of experience, enabling them to make more subtle discriminations among elements of experience. Bieri's work focused on the interpersonal realm and utilized a variety of interpersonal figures (e.g., mother, father, close friend) as elements in an adapted form of Kelly's (1955) Role Construct Repertory Test.

Oppenheimer (1966) was the first to apply the idea of cognitive complexity in the vocational arena. He hypothesized that greater complexity should lead to greater accuracy and thoughtfulness in vocational decision making, and so predicted that complexity would be positively related to congruency between self-concept and occupational ratings. Oppenheimer operationalized cognitive complexity using Bieri's (1955) method of assessing interpersonal complexity. This research did not yield the predicted

relationship between interpersonal differentiation and self-occupational congruence.

A few years later, research on cognitive structure and self-occupational congruence began to assess complexity in the vocational rather than the interpersonal domain. The work of Bodden (1969; 1970) provided the initial focus on vocational complexity. Arguing that the differentiation of the vocational construct system was likely to be more pertinent than interpersonal complexity in career decision making, Bodden (1970) developed the first method for assessing vocational complexity, called the Cognitive Differentiation Grid (CDG). He modified Bieri's (1955) grid by replacing the interpersonal figures with 12 occupations, including "at least one occupation . . . from each of Roe's (1956) occupational groupings" (Bodden, 1970, p. 365) and used 12 vocationally relevant dimensions (e.g., high vs. low income, much vs. little education) instead of interpersonal constructs.

In Bodden's (1970) standard CDG, each career is rated on each vocational construct using a 6-point Likert scale (-3 -2 -1 1 2 3). Two differentiation scores may be obtained from the grid, an Across Constructs score and an Across Occupations score (see Bodden, 1970, p. 365, for a complete explanation of the scoring procedure). The Across Constructs score is an indication of how independently the

construct dimensions are used, while the Across Occupations score reflects differentiation among the careers.

Bodden (1970) compared the relative usefulness of his CDG measure and Bieri's (1955) interpersonal grid in predicting vocational realism and congruency in male and female college undergraduates. Realism was determined by the discrepancy between a subject's ACT scores and the level (based on Roe, 1956) of his or her preferred occupation. Congruency was defined as the amount of agreement between the Holland (1966) code classifications of the preferred career and of the personality style of each subject. Results indicated that interpersonal complexity predicted neither realism nor congruence. Vocational complexity was also unrelated to realism, but the construct differentiation score did predict congruence for the upperclass men in the sample. However, neither construct nor occupational differentiation was related to congruency for underclass men or any of the women in the sample.

In a later study, Bodden and Klein (1972) again found a significant relationship ($r = .30$) between the Across Constructs component of differentiation and vocational congruency in a sample of upperclass men. These findings stimulated two decades of research aimed at discovering the variables underlying and influencing vocational differentiation.

Although many factors influencing vocational differentiation have been identified, the concept does not appear to be associated with either career decidedness or career maturity. Winer et al. (1979) obtained a correlation coefficient near zero between differentiation scores and scores on Crites' (1973) Career Maturity Inventory in a study of 99 undergraduates. Two subsequent studies (Cesari, Winer, Zychlinski, & Laird, 1982; Cesari et al., 1984) found no relationship between career decidedness and vocational differentiation. Because both career decidedness and maturity are concepts demonstrated to have practical significance (Neimeyer, 1988), the lack of relationship caused some researchers to question the usefulness of focusing exclusively on differentiation (e.g., Cesari et al., 1984).

An additional concern has been raised about the replicability and practical significance of Bodden's (1970) finding. The original finding appeared to have limited generalizability from the beginning, since the significant relationship between differentiation and appropriate vocational choice found in both of Bodden's studies (Bodden, 1970; Bodden & Klein, 1972) was observed only in upperclass male subjects. Recently, the replicability of even that result has been called into question by the work of Leso and Neimeyer (1991).

The Leso and Neimeyer (1991) study was, in part, an attempt to replicate and extend Bodden's (1970) results. These researchers intended to again demonstrate that vocational differentiation is positively related to appropriate occupational choice and extend this finding to the use of personal as well as provided construct dimensions. The study was also a part of the growing research literature aimed at identifying ways to affect levels of differentiation, in particular, by providing occupational information to subjects (Bodden & James, 1976; Cesari et al., 1984; Haase, Reed, Winer, & Bodden, 1979; Neimeyer & Ebben, 1985).

The procedure involved a direct replication of Bodden's (1970) and Bodden and James' (1976) studies with the addition of an elicited grid condition. Subjects were 64 male and 105 female undergraduates. All participants filled out the Vocational Preference Inventory (Holland, 1977) and either a standard CDG or an elicited grid. Subjects in the information group then read the identical vocational information used by Bodden and James (1976), while control subjects read a list of addresses where vocational information might be obtained. The elicited or provided grids were then readministered to subjects 48 hours later.

The relationship between differentiation and vocational congruence found by Bodden (1970) in upperclass

men was not found by Leso and Neimeyer (1991), and, like Bodden, these researchers found no relation between differentiation and vocational congruence for women or underclass men. The absence of relationship between differentiation and vocational congruence obtained for use of both provided and personally elicited construct dimensions. Bodden's (1970) finding was, thus, neither replicated nor extended. Leso and Neimeyer (1991) concluded:

> until the results reported by Bodden (1970) and Bodden and Klein (1972) within the subgroup of upperclass men can be replicated and extended to other segments of the college population (i.e., women and underclass men), the importance of such findings to the field of vocational counseling remains uncertain. (p. 5)

Integration

The growing dissatisfaction with vocational differentiation as the sole defining characteristic of vocational complexity led researchers to turn more attention toward the complementary aspect of complexity, integration (see Neimeyer, 1988; O'Keefe & Sypher, 1981). The result was a new focus on the literature concerning correlates of integration. This literature had been existing separately from that on differentiation for several years, and had yielded some intriguing results.

Research on integration has largely operationalized the concept by using the intensity score developed by Bannister and Mair (1968) and described by Fransella and

Bannister (1977). The score reflects the overall amount of correlation in the construct system, regardless of whether that correlation is negative or positive (see Method section for a complete description of the scoring procedure).

Cochran (1977) used intensity scores in a study relating integration to reaction times in a career decision task. Subjects were presented with 25 pairs of occupational values (e.g., unstructured time vs. high salary) and asked to indicate a preference for one of the two alternatives in each. Higher intensity scores were associated with faster reaction times, suggesting that higher levels of integration facilitate decision making.

Cochran (1983) also demonstrated theoretically consistent relationships between integration and the structural concepts of conflict and evaluative accord. Conflict, defined as the amount of negative correlation between preferred poles of the constructs in the system, was negatively correlated with both integration and evaluative accord. Evaluative accord refers to the level of agreement between a subject's stated ordering of preference of the occupations and his or her implicit ordering as reflected in the positivity of the grid ratings. As expected, measures of this variable were positively correlated with intensity scores.

The integration concept does not appear to have sparked as much interest among researchers as that of differentiation, with studies in this area less numerous and their results receiving less attention than Bodden's (1970) well-known findings. Yet the studies described above indicate the theoretical and the practical importance of the integration concept, and collectively their findings seem to suggest that this aspect of cognitive complexity merits some consideration along with its counterpart, differentiation. The need to include integration in attempts to assess the practical utility of vocational construct systems was noted by Neimeyer (1992, p. 97):

> Put plainly, the viability and predictive potential of the construct system is not a unique function of its levels of differentiation. Minimally, its predictive capacity is a joint function of the number of different construct dimensions it contains and the degree of organization among those constructions. This degree of organization speaks directly to Kelly's (1955) Organization Corollary. The Organization Corollary stipulates a hierarchical relationship among constructs in the system. It is this relationship that permits prediction, not the absolute number of different constructs per se.

The Developmental Model

In response to concerns about the practical merit of the notion of differentiation and a growing appreciation of the potential of the concept of integration, Neimeyer and his colleagues (1985) conceptualized a developmental model of vocational construct systems that incorporates both

integration and differentiation. Their recognition of the importance of including both variables in their model followed from Werner's (1957) orthogenetic principle, "Whenever development occurs, it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation and hierarchic organization" (p. 126).

The model of vocational development proposed by Neimeyer et al. (1985) was based on Landfield's (1977) view of differentiation and integration as two independent axes that cross to form four quadrants corresponding to stages of vocational development (Figure 1). These writers described their model as follows:

> Poorly integrated and poorly differentiated schemata are the least developmentally advanced (Quadrant I). . . . Gradually, as individuals learn to anticipate covariation among existing dimensions, the system becomes better integrated . . . (Quadrant II). Continued experience is also reflected in greater differentiation as individuals begin to discern other useful dimensions for vocational judgment (Quadrant III). At this point the individual may be flooded with an appreciation of vocational variations (high differentiation) but as yet lack the ability to relate these together into a systematic and unified interpretive network (low integration). . . . Finally . . . these dimensions are also integrated into an increasingly cohesive and comprehensive schema for interpreting vocational information. This state of high differentiation and high integration (Quadrant IV) is the most developmentally advanced stage. (Neimeyer et al., 1985, pp. 193-194)

The study designed by Neimeyer et al. (1985) to investigate the usefulness of this model consisted of

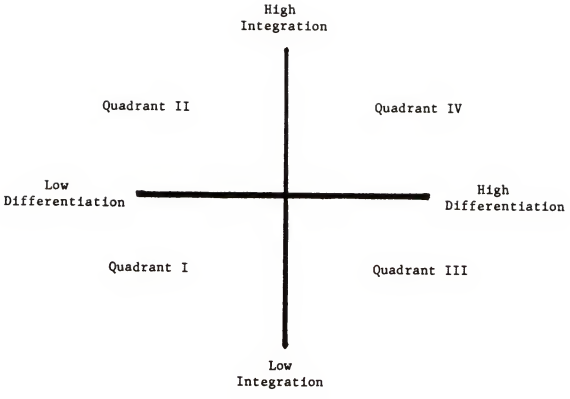


Figure 1. Four quadrants of vocational structure.

administering measures of cognitive structure, vocational decision-making skills, and career decidedness to 60 female and 41 male college undergraduates. Subjects were given, in order, the following materials: the Cognitive Differentiation Grid (Bodden, 1970) to assess levels of differentiation and integration, the Career Decision Scale (Osipow, Carney, & Barak, 1976), a measure of career decidedness, and the Career Development Inventory (Super, Thompson, Lindeman, Jordaan, & Myers, 1981) to assess decision-making skills and current career planning.

The study yielded results consistent with the idea that aspects of vocational behavior vary as a function of cognitive structure. Higher levels of integration were associated with more effective vocational decision-making skills (in particular, with higher scores on the Decision Making subscale of the Career Development Inventory, Super et al., 1981) and with less exploratory career behavior. Higher levels of differentiation were related to lower levels of career planning behavior. However, neither variable was related significantly to career decidedness. Neimeyer et al. (1985) interpreted their results as suggesting that "cognitive structure is more related to the processes involved in career planning (e.g., decision-making skills) than in the outcome itself (e.g., level of decidedness)" (p. 198).

In a second study investigating the developmental model, Nevill et al. (1986) compared groups of subjects falling into each of the four quadrants of the model: subjects who were high in both differentiation and integration, low in both, or high in one variable and low in the other. One hundred ten undergraduates were assessed on knowledge of vocational information, number of career alternatives, career decision making self-efficacy, and vocational identity status.

Results showed that integration and differentiation interacted in important ways to predict aspects of vocational attitudes and behavior. The greatest accuracy in recall of vocational information was demonstrated by subjects with high levels of integration but low levels of differentiation. Greater integration was also associated with larger numbers of expressed career alternatives when levels of differentiation were low. In addition, greater self-confidence (as measured by career decision making self-efficacy scores) was related to higher levels of integration when differentiation was high. Finally, highly integrated subjects also tended to show higher levels of career identity development. In discussing their results, these investigators wrote:

> The above findings underscore the importance of integration as a conceptual tool and are consistent with the recent work which has questioned the overall utility of cognitive differentiation in determining vocational behavior (Cesari et al., 1984). Rather than

> addressing general questions concerning whether it is advantageous or disadvantageous to be highly differentiated, researchers might more usefully aim to determine the particular advantages or disadvantages of each variable under particular conditions (Nevill et. al., 1986, p. 119).

Research on the developmental model was subsequently extended by Neimeyer and Metzler (1987) in a set of studies designed to demonstrate a conceptual relationship between the four quadrants of the model and Marcia's (1966) already established vocational development sequence. Marcia's (1966) conceptualization of development posits movement along two dimensions, crisis and commitment, and results in a four-stage developmental sequence. Individuals who have not engaged in an active struggle to create their own set of occupational priorities and values (low crisis) and also have not invested themselves in any particular occupation or set of values (low commitment) are termed "diffuse." Those who have not actively struggled (low crisis) but instead have preemptively committed themselves to parental values (high commitment) are said to be "foreclosed." "Moratorium" individuals have or are currently struggling with forging their own belief system (high crisis) but have not committed themselves to any career identity (low commitment). Those people who have both struggled with and decided upon a career identity (high crisis and commitment) are called "achieved." According to Marcia (1966), development begins at the diffuse stage and proceeds

through periods of foreclosure and moratorium to the achieved stage.

Neimeyer and Metzler (1987) predicted that the different stages in Marcia's (1966) sequence would correspond to varying levels of the cognitive structure variables. In particular, they expected that diffuse identity development would be reflected by low levels of both differentiation and integration, that foreclosed individuals would display higher levels of integration but lower levels of differentiation, that the moratorium stage would be characterized by high differentiation and low integration, and that achieved individuals would score high on measures of both structural variables. They tested their predictions in three studies. The first was an exploratory attempt to link structural variables with general ideological identity development, while the next two investigated vocational identity development specifically.

In their first study, Neimeyer and Metzler (1987) related the structural scores of 39 undergraduates, representing the four quadrants of the developmental model, to scores on a measure of ideological identity development (the Extended Objective Measure of Ego Identity Status, EOM-EIS, created by Grotevant & Adams, 1984) and to career decision-making self-efficacy scores. They found high levels of differentiation and integration to be predictive

of both higher career self-efficacy and the achieved stage of identity development, while low levels of differentiation were associated with the foreclosed stage.

The following two studies related structural scores to two independent measures of vocational identity development. The first used My Vocational Situation (MVS; Holland, Daiger, & Power, 1980), and the second used the Occupational Identity Scale (OIS; Melgosa, 1985). The second scale has the advantage of corresponding directly to Marcia's (1966) four stages of vocational identity development. The results of these studies indicated that subjects with high levels of both differentiation and integration displayed higher levels of vocational identity development on the MVS and greater likelihood of falling into the achieved stage of development on the OIS. Neimeyer and Metzler (1987) interpreted their results as showing "the predicted correspondence between the development of vocational schemas and the development of vocational identities" (p. 14) and as providing general support for the assumptions of the structural model of Neimeyer et al. (1985), regarding a developmental progression from lower to higher levels of differentiation and integration.

Another study conducted on the structural model of vocational development examined the relationship of differentiation and integration to effectiveness of

vocational decision-making style. Kortas, Neimeyer, and Prichard (1992) hypothesized that the most effective, rational decision-making styles would necessitate the availability of diverse dimensions of judgment, i.e., a highly differentiated system, as well as the high degree of integration among constructs "that provides structure and coherence to vocational judgments" (p. 7). In contrast, they predicted that individuals with poorly integrated and differentiated systems would show more intuitive, dependent decision-making styles. Whereas adequate levels of both structural variables were believed to be necessary for rational decision making, Kortas et al. (1992) stated in an additional hypothesis that sufficient integration would be particularly important in the actual finalizing of career decisions and, thus, would be positively related to levels of career decidedness.

Kortas et al. (1992) administered the CDG and measures of career decision-making style and career decidedness to 598 undergraduates. Results partially supported predictions: As expected, subjects with low levels of differentiation and integration were the most prone to using an intuitive, impulsive decision-making style, and integration scores were positively related to career decidedness. Contrary to predictions, however, rational decision-making styles were associated only with highly integrated systems and dependent styles with poorly

integrated systems, with neither style showing the expected relationship to differentiation.

The findings of the developmental model research studies described thus far suggest that combining integration and differentiation into one predictive model has been a worthwhile enterprise. The model has been shown to correspond meaningfully to other measures of vocational identity development (Neimeyer & Metzler, 1987; Nevill et al., 1986). Additionally, researchers have been able to use the model to make predictions about diverse aspects of vocationally relevant behavior, such as, effective decision making (Kortas et al., 1992; Neimeyer et al., 1985), career exploration and planning (Neimeyer et al., 1985), and accurate occupational information recall (Nevill et al., 1986). Importantly, all of this research has focused on demonstrating the predictive potential of structural variables for proximal rather than distal behavioral outcomes. This is, perhaps, part of the reason that this line of inquiry has had more success than have attempts to relate differentiation to appropriate career choice.

Confirmatory Bias

The present study extends research on the developmental model by testing its ability to predict another type of proximal behavioral outcome, namely, the tendency to conduct a biased versus an unbiased occupational information search. Based on the findings of

social psychological research, there is reason to believe that there are systematic, consistent forms of bias in human decision making processes, and that many of these are still quite poorly understood (Cotton, 1985; Greenwald, 1980; Tversky & Kahneman, 1981). This study attempted to make some contribution to knowledge in this area.

Research in the area of hypothesis testing as a cognitive strategy (e.g., Snyder, 1981; Snyder & Skrypnek, 1981) has demonstrated the existence of a confirmatory bias effect, that is, a tendency on the part of individuals to seek out or selectively attend to or remember information that confirms their preexisting expectations. This section reviews the two confirmatory bias studies most relevant to vocational decision making, setting the stage for the dependent variables used in the present study.

Following from the conclusions of Jordaan (1963) and Osipow (1983), that undistorted hypothesis testing is important and perhaps even necessary for psychological growth, Blustein and Strohmer (1987) wrote that "individuals benefit from an objective and unbiased collection and assessment of relevant information in career decision making" (p. 47). They argued that the vital role played by hypothesis testing in the career decision-making process merited investigation of variables that might affect the amount of bias with which individuals test out their hypotheses. These authors suggested that two such

variables might be the relevance of the occupation being judged to the person's career plans and the provision of objective or expert information.

In the two studies conducted by Blustein and Strohmer (1987), the researchers predicted that higher levels of occupational relevance would be associated with a greater tendency to engage in confirmatory hypothesis testing. With respect to information, they predicted that provision of information would have the effect of lessening or eradicating bias, especially if the information came from an expert and disconfirmed previous expectations of the subjects. The procedure involved subjects rating 20 careers on self-relevance, reading information, and engaging in a hypothesis-testing procedure wherein they listed as many reasons as they could think of for the suitability or unsuitability (for them) of a relevant or irrelevant career.

Results provided partial support of predictions. As expected, subjects judging highly relevant careers exhibited the most confirmatory bias. However, subjects judging highly irrelevant careers exhibited an equally robust bias in the direction of disconfirming the occupations' suitability for them. Only those subjects assessing moderately relevant occupations showed no evidence of bias. Furthermore, neither type of

information, the objective or the expert, had any effect on the amount of bias shown by subjects.

Blustein and Strohmer (1987) interpreted the results of their studies as supporting the idea that people tend to perceive and process information in a way that confirms their preexisting expectations, be they positive or negative, about the suitability of a particular occupation for them. They offered the tentative explanation that this confirmatory bias might be an adaptive strategy for "bolstering the decisiveness of those individuals who have crystallized specific preferences" (Blustein & Strohmer, 1987, p. 62). However, they also noted that career decidedness was not significantly related to degree of bias in either of their studies and noted that biased consideration of career alternatives could be harmful to effective decision making in both career decided and undecided individuals.

The other study on confirmatory bias that is relevant to the proposed project was conducted by Neimeyer, Prichard, Berzonsky, and Metzler (1991). These researchers related amount of confirmatory bias used by subjects to both occupational relevance and vocational identity status (diffuse, foreclosed, moratorium, or achieved). The intent of this work was to replicate the findings of Blustein and Strohmer (1987) and to "determine whether there are individual differences in the extent to which confirmatory

biases dominate vocational exploration" (Neimeyer et al., 1991).

Subjects were first pretested with the EOM-EIS (Grotevant & Adams, 1984) and blocked into four vocational identity status groups: achieved, moratorium, foreclosed, or diffuse (only data from pure-type subjects were included). As in the Blustein and Strohmer (1987) study, subjects rated a list of occupations as to self-relevance and were then randomly assigned to a high, moderate, or low relevance condition. They then read information on a career of the relevance level to which they had been assigned and were given the same hypothesis-testing task as were the subjects of Blustein and Strohmer (1987).

The results of the study replicated and extended the findings of Blustein and Strohmer (1987). Neimeyer et al. (1991) found, as in the previous study, that subjects tended to confirm their expectations with regard to highly relevant or irrelevant careers but were relatively unbiased in judging moderately relevant occupations. In an important qualification to Blustein and Strohmer (1987), they also found that vocational identity status was related to objectivity when subjects judged moderately relevant careers. Individuals who were in the achieved or moratorium stages were less biased in their appraisals of this type of occupation than were subjects in the diffuse or foreclosed stages. However, subjects in all stages of

identity development were clearly biased when assessing careers rooted in a strong self-view, i.e., highly relevant or irrelevant occupations. Neimeyer et al. (1991) stressed the need for "future work to establish the generalizability of these effects across experimental paradigms and vocational domains" (p. 330).

In summary, studies investigating bias in occupational decision-making have found a strong tendency on the part of individuals to attend to and remember information that confirms their preexisting expectations. The tendency appears to persist despite experimental manipulations designed to ameliorate it. Finally, it appears that individuals at different stages of vocational identity development may display different levels of confirmatory bias.

Hypotheses

The present study speaks to Neimeyer et al.'s (1991) call for replication and extension of confirmatory bias effects as well as extending the literature on the structural model of vocational development to include confirmatory bias. In demonstrating that Marcia's (1966) stages of vocational development are meaningfully related to individual differences in confirmatory bias, Neimeyer et al. (1991) set the stage for a study to investigate whether the quadrants in the structural model (Neimeyer et al.,

1985) are also predictive of individual differences in bias.

Thus far, work on the structural model of vocational development has yielded several findings of relevance to this project. First, high levels of both differentiation and integration have been associated with an achieved identity status in both the general ideological and vocational domains (Neimeyer & Metzler, 1987). Low levels of both variables have been related to an intuitive, impulsive decision-making style (Kortas et al., 1992). In addition, high integration with low differentiation has been shown to predict more accurate recall of occupational information (Nevill et al., 1986). Finally, the integration variable by itself has been found to be positively related to rational, effective, and less dependent vocational decision-making styles (Kortas et al., 1992; Neimeyer et al., 1985) as well as vocational identity development (Nevill et al., 1986).

These findings suggest that vocational structure variables are indicative of career identity development and also that they predict proximal behavioral outcomes such as accurate information recall and decision-making style. The correspondence of the structural model to Marcia's (1966) vocational identity development sequence carries implications for applying the model in confirmatory bias research, since Neimeyer et al. (1991) found that achieved

and moratorium stages of development were associated with less bias in attention to confirmatory versus disconfirmatory information. Based on this finding, the general prediction of the present study was that individuals at more advanced stages of development, i.e., those with higher levels of both integration and differentiation, would also tend to be less biased in seeking out occupational information.

Findings on the relationship of vocational structure to decision-making style (Kortas et al., 1992) also imply differences among individuals with respect to objectivity. Kortas et al. (1992) used vocational structure variables to predict three of Dinklage's (1968) decision-making styles: Rational, Intuitive, and Dependent. These styles were assessed using Harren's (1984) Assessment of Career Decision Making (ACDM) instrument. Integration emerged as a particularly important variable in this research, being associated with more rational and less dependent styles; however, Kortas et al. (1992) also found that low levels of integration and differentiation predicted less effective, impulsive decision-making styles. Based on the results of this research, it was hypothesized in the present project that both structural variables, but especially integration, might be related positively to the tendency to conduct a less biased occupational information search.

This study provided a test of these ideas by assessing levels of integration and differentiation in subjects and then having them conduct a search of occupational information in which they had to budget their time, choosing to read positive and/or negative information about a set of careers they viewed either favorably or unfavorably. The process necessitated the subjects' making a conscious decision about how to conduct the search, as enough time would not be provided for them to exhaustively search all information.

High and low levels of each predictor variable (differentiation and integration) were used. A negatively viewed occupations condition was included in order to assess the possibility that individuals have a bias toward reading merely positive, as opposed to confirmatory, information. The main assessment of bias was made by comparing both the amount of time spent reading confirmatory (i.e., positive information for favorably viewed careers, negative information for unfavorably viewed careers) versus disconfirmatory (i.e., positive information for unfavorably viewed careers and vice versa) information and the number of confirmatory versus disconfirmatory information sheets selected for perusal.

Bias was also measured by a thought listing (Cacioppo & Petty, 1981), in which subjects were asked to list their thoughts about the positive and negative attributes of the

careers, basing their listing on information gathered from the occupational descriptions. This type of thought listing differed from that used by Blustein and Strohmer (1987). In discussing their findings, these researchers noted that they had asked subjects to list thoughts about the suitability or unsuitability of occupations based on their knowledge of themselves and, thus, that they may have elicited a listing of preexisting expectations rather than a listing of what aspects of their vocational information had been attended to by subjects. The present study, therefore, made the thought listing directly relevant to information read by the subjects in an attempt to make this measure reflect bias in attention to or memory of that material. Bias was assessed by comparing the number of confirmatory versus disconfirmatory (as indicated by the subjects themselves) thoughts listed by each subject.

Following from the findings of Blustein and Strohmer (1987) and Neimeyer et al. (1991) that subjects judging careers rooted in a strong self-view exhibit a strong confirmatory bias, it was predicted that some level of confirmatory bias would be present in all subjects in this study. It was thought that evidence of this bias would be most likely on the thought listing measure, as it was in previous research.

However, the findings just described on the developmental model of vocational structure indicate that

individuals may differ in the extent of their confirmatory bias. It was hypothesized in this study that levels of both integration and differentiation would be negatively associated with bias. It was predicted that individuals with high levels of both factors would be significantly less biased than individuals with low levels of both factors. This difference was expected to be particularly evident on the reading-time measure of bias. No predictions were made regarding the amount of bias in individuals high in one structural variable but low in the other, as previous research has produced equivocal results with respect to these intermediate conditions (Kortas et al., 1992; Neimeyer & Metzler, 1987).

CHAPTER 3
METHOD

The present study was designed to extend research on the developmental model of vocational structure and connect this literature with that on confirmatory bias. This project examined the relationship between differentiation and integration levels and subjects' tendency to engage in biased or unbiased occupational information searches with regard to either favorably or unfavorably viewed careers.

Subjects

The 189 participants (118 female and 71 male, *M* age = 19.6) in this study were undergraduate students enrolled in University of Florida psychology courses. Participation was voluntary, representing one of a number of possible ways individuals could obtain credit for the classes in which they were enrolled. Each of the subjects was treated in accordance with the "Ethical Principles of Psychologists" (American Psychological Association).

Design

A 2 x 2 x 2 between-subjects factorial design was used to assess the impact of differentiation, integration, and occupational favorability on confirmatory bias. The fully crossed design included two levels of integration (high and

low), two levels of differentiation (high and low), and two levels of favorability (high and low).

Instrumentation

Vocational Structure Grid

Participants were administered Bodden's (1970) standard Cognitive Differentiation Grid (CDG, see Appendix A). This grid provided them with the 12 vocationally-relevant constructs used in Bodden's (1970) measure (e.g., high vs. low income, much vs. little education). Each construct appears along a 7-point Likert scale ranging from -3 to +3 (e.g., low status -3 -2 -1 0 1 2 3 high status). The grid includes 12 occupational titles to be rated along these constructs. All 12 occupations were rated along each construct, using the 7-point Likert scale. From the resulting matrix of 144 ratings (12 occupations rated along 12 constructs) each grid yielded two types of structural scores: the differentiation and the intensity scores.

Differentiation Score

The total differentiation score, comprised of construct and occupational differentiation scores, was calculated using Landfield's (1977) ELTORP II computer program. The construct differentiation component of the score reflects how independently each of the constructs is used in judging the careers. The Landfield (1977) program specifies an 83% overlap criterion for dependence between constructs so that any two constructs used similarly to

rate 10 or more of the 12 occupations are considered functionally dependent. If the constructs are used similarly on 9 or fewer of the careers, they are counted as functionally independent. The construct differentiation score is the total number of independent constructs.

The occupational differentiation component of the differentiation score reflects how differently each of the careers on a grid is rated. It is calculated in an analogous manner to the construct differentiation score. The range of possible scores for either measure is from 1 (failure to differentiate any of the constructs or occupations from any other) to 12 (discrimination of every construct or occupation from every other). The total differentiation score is the sum of functionally independent constructs and occupations and can, therefore, range from 2 to 24. Previous research has found a mean differentiation score of 11.60 (SD = 4.99) in a sample of 808 college undergraduates (Neimeyer & Metzler, 1987).

Intensity Score

Fransella and Bannister's (1977) intensity score was used as a measure of integration, as in previous research (Cochran, 1977, 1983; Neimeyer et al., 1985; Nevill et al., 1986). This score is calculated by deriving the correlation between all possible pairs of construct ratings, squaring each correlation to remove the sign, multiplying by 100 to convert to whole numbers, and summing

across all scores. The resulting intensity score, thus, reflects the overall amount of correlation in the vocational schema. It is commonly interpreted as a measure of integration (see Adams-Webber, 1979, for a review). The intensity score can range from 0 - 6000. Neimeyer and Metzler (1987) found a mean of 1951.04 (SD = 611.08) in a sample of 808 college undergraduates.

Materials

Occupational Title Ratings List

A list of 50 occupations was developed that contains high-point code careers from each of Holland's (1977) six types (Realistic, Conventional, Investigative, Social, Artistic, and Enterprising; see Appendix B). This list was used for participant ratings of how favorably each career was viewed. The rating scale ranges from 1 (highly unfavorable) to 5 (highly favorable).

Descriptions of Careers

Two one-page descriptions of each of the 50 occupations were developed: One description outlines the advantages of the career and the other describes its disadvantages. For each occupational title, vocational information consists of approximately 300 words. Descriptions were based upon the Occupational Outlook Handbook (U.S. Department of Labor), but the information contained therein was cast in either a positive or a negative light, depending upon whether the description was

providing information regarding the advantageous or disadvantageous aspects of a career (see Appendices C and D for examples).

Thought Listing Measure

A thought listing questionnaire (Cacioppo & Petty, 1981) was developed to assess bias in participants' attention to and recall of vocational information (see Appendix E). Directions, provided at the top of the instrument, request that subjects list their thoughts regarding the positive and negative attributes of each career. Participants are directed to base this listing on information gleaned from reading the occupational descriptions.

Mood Assessment

A mood questionnaire was developed to assess participant mood prior to the occupational information search (see Appendix F). This assessment was included in order to control for mood as a possible confounding variable affecting positivity, negativity, or bias in participants' search behavior and thought listings. The questionnaire consists of eight items that assess positive and negative mood states on a 5-point Likert scale. Every other item on the instrument is reverse-scored, and then all item scores are summed to produce one score indicative of overall mood. Scores can range from 8 to 40, with higher scores indicating more positive mood states.

Procedure

Approximately 300 undergraduate psychology students were pretested on the CDG (Appendix A) during a 15-minute segment of one class period. Participants rated each occupational title on the CDG along each of the provided construct dimensions. Differentiation and integration scores were computed from the grids, and possible subjects partitioned into four groups: those high in differentiation and integration, those low in both, and those high in one variable but low in the other. Individuals in each of these groups were contacted through class announcements and by telephone and asked to participate in the study.

The study was administered in 45-minute sessions with one or two participants present for the first part of each session, and each conducting her or his information search alone in the second part of the session. Participants were randomly distributed across conditions of occupational valence (i.e., positively and negatively viewed careers). An attempt was made to obtain approximately equal numbers of men and women at each level of differentiation and integration, as well as in each occupational valence condition. However, fewer men than women were available in the subject pool and, thus, constitute less than half of the sample.

Each session began with participants reading and signing an informed consent form (see Appendix G). Next,

all were given the list of 50 occupational titles (Appendix B) and asked to rate each according to how favorably or unfavorably they viewed it. The rating scale ranges from 1 (highly unfavorable) to 5 (highly favorable). Participants were then asked to circle 12 of the occupations. Titles circled were either 12 favorable or 12 unfavorable careers, depending upon the condition (high or low favorability) of the particular session. Next, the experimenter collected the occupational title lists and used these to assemble two packets of information sheets (one positive and one negative description for each of the 12 circled occupations, resulting in one positive and one negative information packet) for each participant (see Appendices C and D). As the experimenter assembled these packets, participants filled out the mood assessment questionnaire.

After the information sheets were assembled, participants were placed in a room alone with their packets. Each room contained a video camera for the purpose of recording the time spent in reading positive versus negative information. Upon entering the room, the experimenter turned on the video camera. Participants were told that all sessions would be video recorded as a way of standardizing the administration procedure among experimenters and assessing the utility of each person's data. Participants were told that, in order for their data to be usable in the study, they must take out and read only

one information sheet at a time and replace it before pulling out another. This procedure ensured clarity in the measurement of time spent reading positive and negative information sheets.

Participants were requested to gather as much information as they could about the careers but told that there would not be sufficient time for them to read all the information on every information sheet, and, thus, they would need to budget their time in order to get the most out of their reading. They were then given 15 minutes to be alone and read. After this period, the experimenter reentered the room, turned off the camera, and administered, with appropriate directions, the thought listing questionnaire (Appendix G). Participants were given 15 minutes to complete this task and were then asked to go back and indicate, with a + or a - sign beside each thought listed, whether each thought was favorable or unfavorable with regard to the career in question. Finally, each participant was debriefed and assigned experimental credit for participation (see Appendix H).

In sum, this procedure resulted in a 2 x 2 x 2 between subjects design in which subjects either high or low in integration and high or low in differentiation conducted an information search on favorably or unfavorably viewed occupations. The predictive value of these variables was assessed in relation to three measures of bias: the

proportion of time spent reading confirmatory as opposed to disconfirmatory information, the proportion of confirmatory versus disconfirmatory information sheets selected for perusal, and the proportion of thoughts listed that were confirmatory rather than disconfirmatory of preexisting expectations.

CHAPTER 4
RESULTS

Dependent Variables

Three measures of confirmatory bias were used in data analysis. The first was the time measure, calculated as the proportion of time subjects spent reading positively valenced information about their selected careers. The second was the number measure, the proportion of positive information sheets selected out of all sheets chosen for perusal. The thought listing provided the third dependent measure, which was the proportion of positive thoughts generated in response to the information read.

Preliminary Analyses

Pearson correlation coefficients were calculated between differentiation and integration scores to determine whether these variables were sufficiently independent of one another to provide a viable analysis. The correlation between the scores was -.57. This value is consistent with correlations found previously (e.g., Bannister & Mair, 1968).

The significant negative value is generally thought to indicate the difficulty of maintaining higher levels of organization (i.e., integration) as the system becomes

larger (i.e., more differentiated; see Adams-Webber, 1979). The correlation is reflected in the smaller cell sizes in the conditions of low differentiation/low integration and high differentiation/high integration in this study (see Table 1) but was not large enough to prevent use of differentiation and integration as predictor variables.

Analysis of covariance was conducted with the three independent variables and the mood assessment scores. Results showed a main effect for mood on the thought listing measure, $F(8, 187) = 3.95$, $p < .05$. No other effects reached significance. For the number of sheets measure, $F(8, 187) = .01$, $p > .90$. For the time measure, these values were $F(8, 187) = .02$, $p > .80$.

A series of univariate ANOVAs was then conducted along each of the dependent variables. Means and standard deviations for each condition appear in Table 1.

Time

Results of the 2 x 2 x 2 ANOVA for the time measure yielded only a favorability by intensity interaction, $F(7, 181) = 6.12$, $p < .02$. When investigating positively viewed occupations, individuals high in integration were found to spend a greater proportion of time ($M = .54$) reading positive information than those low in integration ($M = .50$). When learning about negatively viewed careers, subjects high in integration spent a smaller proportion of time ($M = .51$) reading positive information than did

subjects low in integration (M = .55). See Figure 2 for a graph of this interaction.

No other main or interactive effects reached statistical significance (all p > .10). A post-hoc Tukey test revealed that none of the means in the two-way interaction were significantly different from any of the others. See Appendix I for a complete listing of F values for nonsignificant tests on each of the dependent variables.

Number

Results of the 2 x 2 x 2 ANOVA along the number measure did not yield any significant main effects or interactions. However, an interaction between favorability and integration approached significance, $F(7, 181) = 3.32$, $p < .07$. When reading about favorably viewed careers, subjects high in integration tended to select a somewhat larger proportion (M = .55) of positive information sheets to read than did subjects low in integration (M = .52). When reading about negatively viewed careers, individuals high in integration tended to choose a somewhat smaller proportion (M = .52) of positive information sheets than did subjects low in integration (M = .54).

Thought Listing

Results of the 2 x 2 x 2 ANOVA along the thought listing measure yielded only a main effect for occupational favorability, $F(7, 181) = 103.17$, $p < .0001$. Subjects

Table 1

Means (and Standard Deviations) for Each of the Dependent Measures as a Function of Occupational Favorability, Integration, and Differentiation

Occupational Favorability	Integration	Differentation	N	Proportion of Time on Positive Information	Proportion of Positive Information Sheets Chosen	Proportion of Positive Thoughts Listed
Favorable	High	High	15	.56 (.14)	.54 (.10)	.57 (.11)
		Low	29	.53 (.13)	.55 (.11)	.55 (.13)
	Low	High	40	.52 (.10)	.53 (.09)	.54 (.16)
		Low	18	.49 (.07)	.50 (.06)	.52 (.16)
Unfavorable	High	High	12	.51 (.08)	.51 (.04)	.27 (.13)
		Low	27	.51 (.10)	.53 (.08)	.30 (.15)
	Low	High	33	.54 (.13)	.53 (.10)	.32 (.18)
		Low	15	.58 (.10)	.56 (.10)	.33 (.12)

Note: Standard deviations appear in parentheses

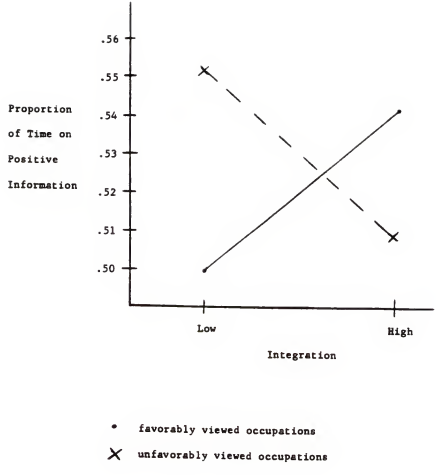


Figure 2. Favorability by integration interaction.

writing about favorably viewed careers listed a larger proportion (M = .54) of positive thoughts than did subjects writing about unfavorably viewed careers (M = .31). No interactions reached significance.

CHAPTER 5
DISCUSSION

Introduction

The purpose of this study was to bridge the literatures on the developmental model of vocational structure and confirmatory bias. Previous findings have implied an association between higher levels of differentiation and integration and greater objectivity (Kortas et al., 1992). Blustein and Strohmer (1987) demonstrated the pervasiveness of confirmatory bias in subjects' thoughts about careers and emphasized the possible maladaptiveness of this bias. Neimeyer et al. (1991) found a relationship between Marcia's (1966) stages of vocational development and individual differences in confirmatory bias. The present project employed the developmental model created by Neimeyer et al. (1985), using differentiation and integration to predict three proximal behavioral indicators of bias.

The primary hypothesis of this study was that levels of differentiation and integration would be positively related to the tendency to be less biased in a search of occupational information. In particular, it was predicted that individuals high in both qualities would be less

biased than individuals low in both qualities. No specific predictions were made concerning those people high in one variable and low in the other, but one might expect scores in these two categories to fall in between those of the other two groups. The primary hypothesis would have been supported by obtaining two, two-way interactions on any or all of the dependent variables. These would have included an interaction between levels of differentiation and occupational favorability, on the one hand, and an interaction between levels of integration and favorability, on the other. For the time variable, for example, it was expected that subjects researching liked occupations would differ in the proportion of time spent reading positive information: Those high in differentiation and/or integration were expected to spend less time on positive (i.e., confirmatory) information than subjects low in one or both qualities. Conversely, for subjects researching disliked occupations, higher levels of differentiation and/or integration would be related to more time spent on positive (i.e., disconfirmatory) information.

The data obtained in the study, however, do not support this hypothesis. As shown in Figure 2, the significant interaction obtained between integration and occupational favorability runs counter to predictions, with higher integration scores associated with greater confirmatory bias. Individuals high in integration spent

significantly more time reading confirmatory information than those low in integration, i.e., they spent more time reading positive information on liked occupations and less time reading positive information on disliked occupations as compared to their low-integration counterparts.

This finding is underscored by results on the second dependent variable, proportion of positive information sheets selected for perusal. As with the time measure, higher integration scores were related to greater confirmatory bias on this variable in an interaction that approached, but did not attain, statistical significance. More specifically, there was some tendency on the part of individuals high in integration to select a greater number of information sheets that were confirmatory of their prior positive or negative views of the careers.

Neither integration nor differentiation was related to bias on the thought listing measure. In fact, no significant relationships were observed between differentiation and confirmatory bias on any of the dependent variables. Inspection of the means in Table 1, however, reveals a tendency toward greater confirmatory bias among individuals high in both differentiation and integration as compared to those low in both qualities. The tendency pervades the data, obtaining for all of the dependent variables and in both conditions of occupational favorability. This finding is consistent with the

intensity/favorability interactions in running counter to initial expectations. Thus, overall, the hypothesis that higher integration and differentiation would be associated with less bias was not only not supported but was actually contradicted by the data obtained in this study.

A secondary prediction in this work was that, consistent with previous work (Blustein & Strohmer, 1987; Neimeyer et al., 1991), confirmatory bias would be particularly evident in all subjects on the thought listing measure. This expectation was borne out in the main effect for favorability, wherein all subject groups had a high proportion of thoughts about liked occupations and a low proportion of positive thoughts about disliked occupations. The reliability of this finding across research projects indicates the robustness of the confirmatory bias effect when thought listing measures are used.

Although the results of this study do not support the primary hypothesis, they are significant in that vocational structure was found to be predictive of one measure of confirmatory bias. Integration appears to be positively related to bias in a search of occupational information and to be slightly more predictive of bias when looked at in combination with differentiation scores. This finding, as well as the replication of the thought listing bias effect found by other researchers, has implications for both the literatures on vocational structure and confirmatory bias.

The following four sections discuss the present findings in relation to previous work on differentiation, integration, the developmental model, and confirmatory bias.

Differentiation

One of the aims of this project was to provide a test of the practical utility of cognitive differentiation in a specific area of vocational behavior. The decision to attempt to demonstrate the usefulness of the differentiation variable was based upon the sparseness of existing evidence for its practical value as well as in response to concern expressed by other workers in the field (Cesari et al., 1984; Leso & Neimeyer, 1991). A great deal of research has been conducted on differentiation since Bodden (1970) and Bodden and Klein (1972) found it to be related to vocational congruency. But the limited nature of those findings (significant results were obtained only with upperclass men) and the failure of subsequent efforts to relate differentiation to either career maturity (Winer et al., 1979) or career decidedness (Cesari et al., 1982, 1984) raised concern that the intense research focus on ways to influence people's differentiation levels might be unwarranted. Cesari et al. (1984) stated,

> Bodden (1970b) and Haase et al. (1979) implied that cognitive complexity is more desirable than cognitive simplicity in making a vocational decision. At this point, there is no empirical evidence for this statement. . . . It appears to be time for research to address the issue of merit of cognitive complexity-simplicity

> [differentiation] in vocational decision making. (Cesari et al., 1984, pp. 222-223)

The results of the Leso and Neimeyer (1991) study, in which Bodden's original findings were not replicated, further heightened concern about the practical utility of differentiation.

The present study speaks directly to these concerns. The results obtained are consistent with the overall picture painted by research thus far: It appears that vocational differentiation continues to be of undemonstrated value as a behavioral predictor variable. Differentiation was unrelated to any of the three measures of confirmatory bias used in this study, nor did it produce statistically significant interactions with integration.

The concerns expressed by Cesari et al. (1984) remain unanswered. The present results do not support a continuation of work aimed at finding ways to heighten levels of differentiation, nor do they support the intense focus on differentiation in comparison to integration that currently exists in the literature. The nonsignificanct trend among the means in Table 1 does indicate, however, that continued investigation of the behavioral correlates of differentiation (conceptualized as a part of a vocational development model) is warranted in order to continue to assess the predictive possibilities of this variable.

Integration

As stated in Chapter 2, less attention has been given to the concept of integration than to that of differentiation in the vocational structure literature. This is despite the fact that, as Neimeyer (1992) stated, the usefulness of the construct system to the person cannot be solely based upon the size of the system but must also be a function of its degree of organization. The results of this study strongly support the notion that investigation of the integration variable is worthwhile. Integration scores, either alone or in combination with differentiation scores, were predictive of subjects' tendency to seek out and spend time reading occupational information that was confirmatory of their preexisting expectations. Higher levels of integration seem to be associated with greater tendencies toward confirmatory bias in this area of behavior.

The finding of a positive relationship between vocational integration and bias suggests some interesting possibilities about the nature of this structural variable, particularly when the findings of Cochran (1977, 1983) are considered. In his first study (Cochran, 1977), higher levels of integration were found to predict faster decision-making times. In the second (Cochran, 1983), integration was negatively correlated with amount of conflict within the construct system and positively

correlated with evaluative accord, i.e., consistency between explicit and implicit rank orderings of occupations. A common theme shared by all three of Cochran's findings is the association of integration with the absence of conflict within the construct system: Clear relationships between constructs, relations uncomplicated by conflict, might reasonably be hypothesized to be the reason for faster decision-making times; likewise, this factor could also account for a high level of evaluative accord.

The present data might be viewed as indicating a possible mechanism by which a highly integrated construct system comes by its lack of conflict. Paying more attention to information that is confirmatory of existing relationships in the system and less to information that is disconfirmatory might well function to keep conflict in the system to a minimum. Conceptualized in this way, bias might be adaptive for the individual by helping to maximize efficiency in thought processes and decision making.

The implications the present results carry for the importance of the connection between vocational integration, conflict, and bias warrant more research aimed specifically at clarifying the relationships among these variables. It will also be important to attempt to discern when and under what circumstances high levels of integration and/or bias are adaptive and maladaptive.

Present findings suggest that integration by itself is a concept of significant practical utility, showing promise as a predictor variable for proximal vocational behaviors (i.e., career information search strategies).

Developmental Model

The developmental model of vocational structure conceptualized by Neimeyer et al. (1985) includes four stages of development characterized by different levels of vocational differentiation and integration (see Figure 1). In the first stage, construct systems possess low levels of both variables. In the second stage, systems become more integrated but continue to remain poorly differentiated. As differentiation increases in the third stage, it is more difficult to maintain organization, and, thus, integration is low. In the fourth stage, individuals have achieved a highly differentiated system that is also well integrated.

Research on this stage model of vocational structure has found different correlates of the first and fourth hypothesized stages of schema development (refer to Figure 1): Individuals in the first stage, characterized by low levels of differentiation and integration, have been shown to exhibit an intuitive, impulsive career decision-making style (Kortas et al., 1992), while those in the fourth stage, characterized by high differentiation and integration, have been found to have higher levels of career self-efficacy (Neimeyer & Metzler, 1987; Nevill et

al., 1986) and to be more likely to be at more advanced stages of career identity development (Neimeyer & Metzler, 1987).

The results of this study suggest another difference between these groups, with the fourth stage of the model associated with higher levels of confirmatory bias. In fact, inspection of the means in Table 1 reveals a consistent pattern in the data. In four of the six data categories, the amount of bias increases step-wise through the stages of the developmental model, with the lowest bias in subjects in Quadrant 1, intermediate levels of bias in subjects in Quadrants 2 and 3, and the most bias in subjects in Quadrant 4. In all six data categories, Quadrant 4 individuals show greater bias than Quadrant 1 individuals. Replication of this tendency in the data would need to be made before drawing general conclusions in regard to its implications, but the consistency of the trend across three different indicators of bias and the counterintuitiveness of the effect itself warrant some speculation about its meaning.

The findings of Kortas et al. (1992), Neimeyer and Metzler (1987), and Nevill et al. (1986) suggest a progression in development of vocational schemas from Quadrant 1 to Quadrant 4 of the model. It appears from this research that higher levels of vocational differentiation and integration are indeed indicative, as

hypothesized by researchers, of individuals who have both struggled with and settled upon an occupational identity, whereas subjects low in both variables exhibit a type of decision-making style suggestive of a relatively undeveloped occupational identity.

The presence of greater confirmatory bias in people with a more settled career identity might indicate a tendency to avoid cognitive dissonance caused by information disconfirmatory to a schema in which they have a large investment of time and energy. This perspective is supported by social psychological research on selective exposure, which has found that people are more likely to selectively attend to confirmatory or supportive information if they perceive that the choice they have made is irrevocable (Frey, 1981; Lowe & Steiner, 1968). Presumably, people who have invested considerable effort into forging a career identity will feel that their choice is less easily reversed compared to individuals who have not made this investment. Thus, people at an earlier stage of identity development might have less of a need to use bias to avoid dissonance.

For people who have gone through the process of self and career exploration and, thus, come to a considered decision about career identity and/or choice, confirmatory bias might be an adaptive strategy. Bias may serve to bolster confidence in their decision, allowing them to move

ahead in pursuing their goals rather than becoming repeatedly drawn into self-doubt. There is evidence in the social psychological literature that individuals who are in a post-decisional phase in a choice-making process are in a different frame of mind than those in a pre-decisional phase, and that this mindset is indeed characterized by less receptivity to incoming information (Heckhausen & Gollwitzer, 1987). In addition, there is a substantial literature indicating that people do in fact engage in information-control strategies as a form of bias, and that these strategies "function to preserve organization in cognitive structures" (Greenwald, 1980, p. 603).

However, the correspondence between individuals in Quadrant 4 of the model and those in advanced stages of career identity development was not perfect in the studies investigating this relationship (Neimeyer & Metzler, 1987; Nevill et al., 1986). It appears from this work that there exist some people in Quadrant 4 of the model who have not attained a clear choice or career identity, and for these individuals, avoidance of bias might be important in making an appropriate decision. Results of this study suggest that these individuals are likely to be biased and, so, could perhaps benefit from vocational counseling that puts particular emphasis on helping them pay attention to disconfirmatory as well as confirmatory information about occupations.

Further research on bias and the developmental model may help to clarify the adaptiveness of bias for particular individuals and situations. Present findings indicate the model is indeed useful for predicting proximal vocational behaviors; therefore, continued investigation into other behavioral correlates of the model would be likely to be productive.

Confirmatory Bias

The results of this study are consistent with those of other research on confirmatory bias in vocational decision making. Relevant findings in this area come from Blustein and Strohmer (1987) and Neimeyer et al. (1991). Blustein and Strohmer (1987) found that subjects judging highly relevant or highly irrelevant careers exhibited confirmatory bias, regardless of whether or not they had been provided information on the careers. Neimeyer et al. (1991) also found confirmatory bias in all subjects judging careers rooted in a strong self-view. Both projects used thought listings to measure bias. The present data from the thought listing dependent measure replicate these previous findings, with all subjects demonstrating bias in the direction of confirming preexisting expectations, whether positive or negative. As with the Blustein and Strohmer study, this project did not find a way of differentiating amount of bias among individuals on the thought listing task. It appears that, at least with the

use of thought listings, confirmatory bias is quite strong when individuals consider affectively laden career alternatives.

Both of the previous projects found lower levels of bias in subjects who judged careers only moderately relevant to their interests. Within this subgroup, people at higher levels of career identity development were less biased than those at lower levels (Neimeyer et al., 1991). The present study found higher levels of bias in subjects likely to be at higher levels of identity development. The major difference between the two findings is the emotionally-charged nature of the careers in this study. Comparing the two results, it appears that individuals at more advanced stages of schema or identity development may possess a greater tendency to engage in unbiased thinking, in general (see Kortas et al., 1992; Neimeyer et al., 1985), but may reverse this tendency in order to preserve the integrity of schemas imbued with high personal investment. This type of pattern might be highly efficient and effectively protective against time- and energy-sapping cognitive dissonance. But such an interpretation is at odds with the conclusions of previous researchers in confirmatory bias.

According to Blustein and Strohmer (1987), Jordaan (1963), and Osipow (1983), bias is a significant impediment to psychological growth and can be disadvantageous to both

career decided and undecided people. It is undoubtedly true that confirmatory bias can hamper decision making by disallowing disconfirmatory but pertinent information. But the findings of the present study, when examined in the context of prior vocational structure research, suggest the possibility that bias may serve useful purposes as well. Specifically, it may be that confirmatory bias is disadvantageous early in the career exploration process but may actually become constructive and adaptive once a viable career identity is formed.

Further research might attempt to test the validity of this hypothesis. More investigation in this area is certainly warranted in order to clarify the seemingly complex nature of confirmatory bias. For example, a study that used both stage of vocational identity development and career decidedness to predict bias might help to clarify whether more bias occurs in people for whom it might actually be adaptive. Researchers should consider using multiple measures of bias, as thought listings may produce an effect too robust to allow assessment of differences among groups.

Summary and Conclusions

Results of this study contradicted expected outcomes, but suggested significant relationships between predictor and dependent variables. Moreover, results replicated and extended previous research in a number of ways.

The most important finding was that higher levels of vocational integration were associated with greater, rather than less, confirmatory bias. This result was reflected in the reading time measure and as a nonsignificant trend in the number of selected information sheets measure of bias. Results did not indicate the utility of vocational differentiation as a unique predictor of bias, but suggested the possibility that it might be useful in increasing the predictive power of integration. Specifically, individuals high in both variables, who are likely to be at more advanced stages of career schema and identity development, appear to be more biased than people low in both variables. Consistent with previous work, a robust and pervasive confirmatory bias effect was found on the thought listing measure for all subjects judging careers rooted in a strong self-view.

A limitation of this study was the artificiality of the experimental setting. Subjects were videotaped and told to gather all the information they could about the careers. This situation may have produced an implicit demand for subjects to read both positive and negative information and, thereby, may have resulted in their showing less bias than they would normally exhibit (see Cotton, 1985, p. 29, for a discussion of this issue). Further research in this area might attempt to increase external validity by observing subjects in a more

naturalistic setting and using a less structured task format.

The present results are significant in showing that vocational structure can be predictive of an important aspect of vocationally-relevant behavior. While integration by itself is predictive of bias in an occupational information search, it appears that its predictive power may be increased somewhat when it is looked at in combination with differentiation. These data, then, support the usefulness of the developmental model of vocational structure. Present results also speak to previous literature on integration in revealing for the first time a possible disadvantage associated with high levels of this variable.

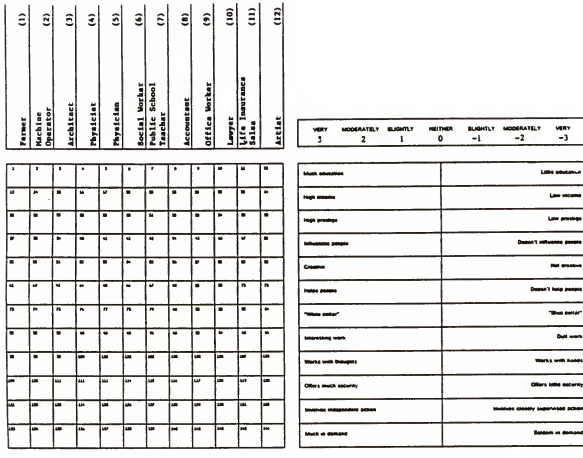
Still at issue is the adaptiveness or maladaptiveness of confirmatory bias in an occupational information search. The present study assumed the maladaptive nature of bias from the outset and so did not address itself to this question. Results, however, make it appear that the issue of bias is more complex than has been previously assumed. In particular, it may be that confirmatory bias is adaptive for some individuals, perhaps for those who have a well-considered career identity in place.

However, clearly confirmatory bias, particularly during early stages of career exploration, is unlikely to be uniformly helpful in decision making. It could cause

people to disregard possibly satisfying career alternatives or to cling to unrealistically positive views of other careers if their perspectives are based on incomplete consideration of available information. Results of the present study highlight the importance of this area for future research.

In conclusion, this project demonstrated a significant relationship between vocational structure and confirmatory bias. The possible implication for vocational counseling is that people with high levels of vocational integration, and especially those who are also high in differentiation, may need special assistance in making sure they explore all relevant aspects of information about career alternatives, i.e., information that is both confirmatory and disconfirmatory of their existing views. However, more research is needed to clarify the relationships between vocational structure and bias, as well as to ascertain the adaptiveness of bias for various individuals and situations, before clearer applications of this literature to counseling can be made. Future researchers in this area might profitably make use of the theoretical constructs of the developmental model of vocational structure and operationalize the concept of bias using multiple measures.

APPENDIX A
COGNITIVE DIFFERENTIATION GRID



APPENDIX B
OCCUPATIONS

Please read through the following occupations carefully. Then indicate how favorably or unfavorably you view each one, using the rating scale given below.

5	4	3	2	1
highly favorable	somewhat favorable	neutral	somewhat unfavorable	highly unfavorable

1. Accountant _____
2. Actor _____
3. Aerospace Engineer _____
4. Aircraft Pilot _____
5. Airtraffic Controller _____
6. Architect _____
7. Bank Teller _____
8. Biological Scientist _____
9. Bookkeeping Clerk _____
10. Business Executive _____
11. Computer Operator _____
12. Computer Programmer _____
13. Correction Officer _____
14. Cosmetologist _____
15. Dancer _____
16. Dental Assistant _____
17. Dentist _____
18. Electrical Engineer _____
19. Electrician _____
20. Food/Beverage Service _____
21. Forester _____
22. Geologist _____
23. Insurance Sales _____
24. Landscape Architect _____
25. Lawyer _____
26. Librarian _____
27. Licensed Practical Nurse _____
28. Mathematician _____
29. Meteorologist _____
30. Musician _____
31. Occupational Therapist _____
32. Office Clerk _____
33. Pharmacist _____
34. Photographer _____
35. Physical Therapist _____
36. Physician _____
37. Printing Press Operator _____
38. Psychologist _____
39. Radio & TV Newscaster _____
40. Real Estate Agent _____
41. Registered Nurse _____
42. Reporter _____
43. Restaurant Manager _____
44. Secretary _____
45. Social Worker _____
46. Statistician _____
47. Surveyor _____
48. Tool & Die Maker _____
49. Veterinarian _____
50. Writer & Editor _____

APPENDIX C
ACCOUNTANTS (positive)

Accountants are important members of the management division of nearly all business, industrial, and government organizations. They provide extremely valuable financial information to managers, and thus occupy positions of respect and influence in the upper echelons of their organizations. They are trusted and relied upon by the highest-ranking executives and managers. Their professional opinions are regularly sought and are generally given considerable weight when crucial decisions concerning the organization's finances must be made. The work is challenging, and is well rewarded both financially and in terms of benefits and working conditions. Salaries in this field are generally high, medical and retirement benefits are excellent, and most accountants work in comfortable offices.

There is considerable freedom in the field to choose the type of position best suited to individual needs. Accountants may work for large or small firms, or may choose to be self-employed. Many accountants have the opportunity to travel to the home offices of clients while they are conducting audits. Self-employed accountants may choose to do much of their work at home. Most accountants are able to specialize in their chosen area of interest. Advancement opportunities in the field are quite good; capable accountants can advance rapidly. The job outlook for accountants is favorable. Employment in this field is expected to grow much faster than the average for all occupations through the year 2000 due to the key role these workers play in the management of all types of businesses. Opportunities are expected to be favorable for college graduates seeking accounting jobs. Accountants rarely lose their jobs when other workers are laid off during hard economic times.

<u>What workers in the field have to say</u>

"I believe that the two most likable aspects of my job are the comfortable working conditions and the excellent advancement opportunities."

"This is a particularly exciting career for me because I have been able to travel frequently and I can take my family with me!"

APPENDIX D
ACCOUNTANTS (negative)

Accountants are part of the administrative bureaucracy of the organizations by which they are employed, and as such their tasks include checking for mismanagement, waste, and fraud. This aspect of their work makes many accountants unpopular with their coworkers. They are often viewed by others as watchdogs for the management, and may be avoided or viewed with suspicion. For this reason, many accountants report feeling alienated and lonely in the workplace. The day-to-day work of accountants is generally extremely detail-oriented. A great deal of patience is required to sustain concentration on lists of figures and through the tedious tasks involved in preparing, analyzing, and verifying financial reports. The work can become very routine, and those who cannot stave off boredom may find the career unsatisfying.

Many accountants work long hours, especially during the tax season and at the end of the fiscal year. The work is often frustrating and extremely stressful, because accountants must know, understand, and conform to constantly changing and increasingly complex tax laws, and must do so in the face of rigid deadlines. In the majority of states, CPA's are the only accountants who are licensed and regulated. The CPA exam is difficult and CPA positions are highly competitive. Nearly all states require CPA's to complete a certain number of hours of continuing professional education every year before licenses can be renewed. Those having inadequate academic preparation may be assigned routine jobs and find promotion difficult. Most employers prefer graduates who have worked part time in a business or accounting firm while in school. In fact, experience has become so important that many employers are seeking persons with 1 to 2 years' experience for beginning accounting positions.

<u>What workers in the field have to say</u>

"If you're not prepared for working long and tedious hours during the tax season, during audits, and at the end of the business year, you're in for a big surprise."

"An extensive amount of concentration is required, and you must be able to withstand the intense deadline pressure if you plan to go into this field."

APPENDIX E
THOUGHT LISTING QUESTIONNAIRE

Please take a few moments to write down your thoughts regarding each of the twelve occupations. In writing down your thoughts, please base your comments on information obtained from the readings you just completed.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

APPENDIX F
MOOD ASSESSMENT QUESTIONNAIRE

MOOD ASSESSMENT

We would like to get some information about your current mood state. Please indicate to what extent you are experiencing various mood states by circling the appropriate number on each of the items below.

To what extent are you presently feeling:

happy

not at all 1 2 3 4 5 very

disappointed

not at all 1 2 3 4 5 very

content

not at all 1 2 3 4 5 very

angry

not at all 1 2 3 4 5 very

satisfied

not at all 1 2 3 4 5 very

annoyed

not at all 1 2 3 4 5 very

interested

not at all 1 2 3 4 5 very

bored

not at all 1 2 3 4 5 very

APPENDIX G
INFORMED CONSENT FORM

UNIVERSITY OF FLORIDA

INFORMED CONSENT FORM

Name: _____ ID # _____

Telephone: _____ Address: _____

Age: _____ Sex: _____ _____

Project Number: _____ _____

Project Title: Career Perceptions

Principal Investigator: Jane Parr, Graduate Student in Counseling Psychology, 114 Psychology, 392-0264

I agree to participate in the research as described below:

This study will explore your perceptions of different careers. At the beginning of the experiment, you will be given a list of occupations. You will be asked to choose twelve of them, and then to read information pertaining to them. Afterwards, you will be asked to write down your thoughts about the careers. Part of your participation will be videotaped in order to standardize the administration procedures used in this study. Only members of the research team administering this study will have access to the videotapes. All videotapes will be erased promptly following completion of the project. The experiment will take less than one hour to complete, and no compensation will be given other than the experimental credit you receive for your class. Confidentiality of information obtained in this research will be maintained by replacing your name with a number used for identification purposes. Feel free to ask any questions you may have at this time. If you have any questions after today, please contact me, Jane Parr, at room 114 Psychology Building, box # 127.

The above stated the nature and purpose of this research, and all discomforts and risks (if any) have been explained to me. I understand that this study may be used for educational purposes that may include publication. I also understand that I may withdraw my consent at any time without prejudice. I have read and understand the above information, and I have received a copy of this description. I agree to participate in this study.

Signed _____ Date _____

I have defined and explained fully this research to the participant whose signature appears above.

Signed _____ Date _____

APPENDIX H
DEBRIEFING POLICY

University of Florida

DEBRIEFING POLICY

The study that you have just completed was designed to assess the ways in which different types of people make use of different kinds of occupational information. The videotaping part of this study was not actually a means of standardizing administration procedures, but instead was a way of examining how people conduct a search of occupational information.

Because we wanted to examine the ways in which people use both positive and negative vocational information, the information you read was designed to be either entirely positive or entirely negative. Although none of the information was deliberately falsified, each sheet was designed to present a one-sided view of a career. Therefore, we ask that you not assume that the information you read was entirely factual and objectively valid.

Finally, we urge you to keep this information confidential. Please keep in mind that you will be helping to advance knowledge in the field of psychology by not discussing this study with others who may choose to participate in this experiment. Please feel free to ask the experimenter any questions you may have at this time.

Having read the above information, please sign below if you now consent to have your data used in this experiment. Thank you.

Signature: _____

APPENDIX I
F AND p VALUES FOR NONSIGNIFICANT TESTS

Time Measure

Independent Variables	F-value	p-value
favorability	0.39	.5311
integration	0.00	.9709
differentiation	0.09	.7670
favorability x differentiation	2.34	.1276
integration x differentiation	0.30	.5838
fav x diff x int	0.30	.5869

Number Measure

favorability	0.00	.9945
integration	0.00	.9950
favorability x integration	3.32	.0702
differentiation	0.06	.8125
favorability x differentiation	1.33	.2511
integration x differentiation	0.27	.6047
fav x diff x int	0.62	.4325

Thought Listing

integration	0.07	.7867
favorability x integration	1.78	.1841
differentiation	0.01	.9253
favorability x differentiation	0.78	.3768
integration x differentiation	0.02	.8847
fav x diff x int	0.03	.8666

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BIOGRAPHICAL SKETCH

Jane Marie Parr was born in Nashville, Tennessee, on June 24, 1963, and has resided in Gainesville, Florida, since 1965. She received the Bachelor of Science degree in psychology from the University of Florida in May 1987. Upon graduation, she was accepted into the counseling psychology Ph.D. program at the University of Florida. Throughout her graduate career, she has pursued research interests in personal construct psychology and clinical specialties in gender and diversity issues.

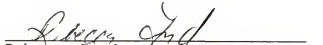
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Greg J. Neimeyer, Chairman
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

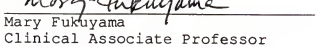
Monica Biernat
Assistant Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Rebecca Ford
Assistant Professor of Sociology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Mary Fukuyama
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of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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Associate Professor of Psychology

This dissertation was submitted to the Graduate Faculty of the Department of Psychology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August 1993

Dean, Graduate School